USGS
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# Metal Industry Indicators

## Indicators of Domestic Primary Metals, Steel, Aluminum, and Copper Activity

September 1999

**The primary metals leading index increased in August, marking its ninth increase in the past 11 months. This index and the other metal industry leading indexes continue to signal moderate near-term growth in overall U.S. primary metals activity. The latest metals price leading index indicates that increased prices for some metals are more likely in the near future, partly because of upward revisions to June data for two index components.**

The **primary metals leading index** advanced 0.5% in August to 129.5, up from 128.9 in July. Its 6-month smoothed growth rate, a compound annual rate that measures the near-term trend, increased to 4.1% from 3.6% in July. A growth rate above +1.0% is usually a sign of an upward near-term trend for future metals activity.

Four of the index's eight components were available in time for the August index calculation. Three components, the growth rate of the Journal of Commerce metals price index, the Purchasing Managers' Index, and the S&P stock price index for diversified machinery companies, moved higher, while the fourth available component, the length of the average workweek in primary metals establishments, slid lower. For the past 4 months, the growth rates of the primary metals leading index have been above 3.5%, the best performance since fall 1997.

The **steel leading index** dropped 0.5% in July, the latest month for which it is available, down to 112.3 from 112.9 in June. The index's 6-month smoothed growth rate also slowed, falling to 4.2% from 5.8% in June. The components most responsible for the decline in the leading index were the Purchasing Managers' Index, the industrial production index for automotive products, and the growth rate of inflation-adjusted M2 money supply. Despite the July drop in the steel leading index, its growth rate remains relatively high and points to increased growth in U.S. steel activity in the near future.

The **aluminum mill products leading index** declined 0.6% in July, slipping to 158.1 from an upwardly revised 159.0 in June, and the index's 6-month smoothed growth rate slowed to 3.6% from a revised 5.4% in June. The same three components that were primarily responsible for the decline in the steel leading index, the Purchasing Managers' Index, the industrial production index for automotive products, and the growth rate of the inflation-adjusted M2 money supply, also accounted for most of the net decrease in the aluminum mill products leading index. The largest positive contribution to the index came from the length of the average workweek in aluminum mill products establishments. The 6-month smoothed growth rate of the leading index continues to suggest increased growth for domestic aluminum mill products activity in the coming months.

The **primary aluminum leading index** edged up 0.2% in July to 91.1 from a revised 90.9 in June, but the index's 6-month smoothed growth rate slowed slightly to 5.2% from a revised 5.4% in June. A 6.5-percent increase in the LME spot price for aluminum made the largest positive contribution to the net increase in the leading index. The primary aluminum leading index, which has increased in 9 of the last 11 months, is signaling increased demand for primary aluminum over the next several months. (Tables and charts for the primary aluminum indexes are in a separate file.)

The **copper leading index** increased 0.5% in July to 132.8 from a revised 132.2 in June, while the index's 6-month smoothed growth rate increased to 4.9% from a revised 4.6% in June, marking the highest growth rate for this index since March 1997. The copper leading index continues to point to increased future demand for copper. However, much of this demand will likely be satisfied by copper currently held in inventory, so U.S. copper production may not pick up immediately.

### Rising Leading Index of Metal Prices and Falling Metal Products Inventories Point to Higher Metal Prices

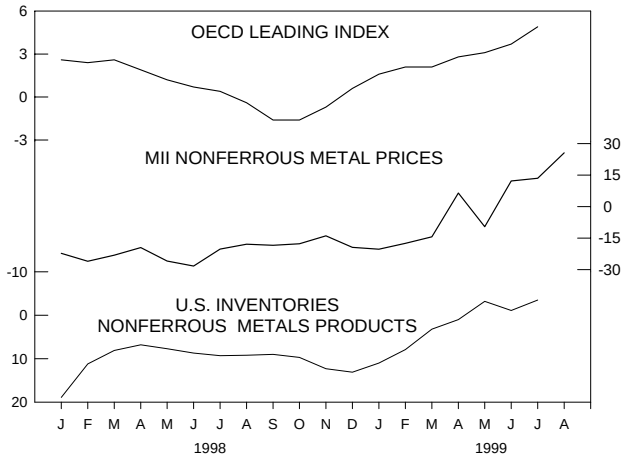
The **metals price leading index** increased 0.3% in July, the latest month for which it is available, to 98.3, up from a revised 98.0 in June. The index's 6-month smoothed growth rate also rose, increasing to 1.4% from a revised 1.0% in June. The most significant factor in the July increase in the leading index was an unusually large increase in the growth rate of one component,

the OECD total leading index. The growth rate of the inflation-adjusted value of U.S. M2 money supply made the largest negative contribution, while two remaining components, the growth rates of building permits for new U.S. housing and the inflation-adjusted value of new orders for U.S. nonferrous and other primary metals, were little changed. Also, the June index was revised sharply higher, because of upward revisions to the growth rates of new orders and the OECD total leading index.

The 6-month smoothed growth rate of the inflation-adjusted value of U.S. nonferrous metal products inventories slowed to -3.5% in July from a revised -1.1% in June. This is the lowest growth rate for this indicator in over 2 years. However, the level of these inventories still remains relatively high.

The leading index of metal prices, an indicator of the demand for metals, and the growth rate of metal inventories, an indicator of supply, both point to the possibility of increases in overall metal prices in the near term. The business cycle and inventories are only two factors in metals price determination. Other factors that affect prices include changes in metals production, foreign exchange rates, speculation, strategic stockpiling, and production costs.

GROWTH RATE SNAPSHOT




## Table 1.
## Leading Index of Metal Prices and Growth Rates of the Nonferrous Metals Price Index, Inventories of Nonferrous Metal Products, and Selected Metal Prices

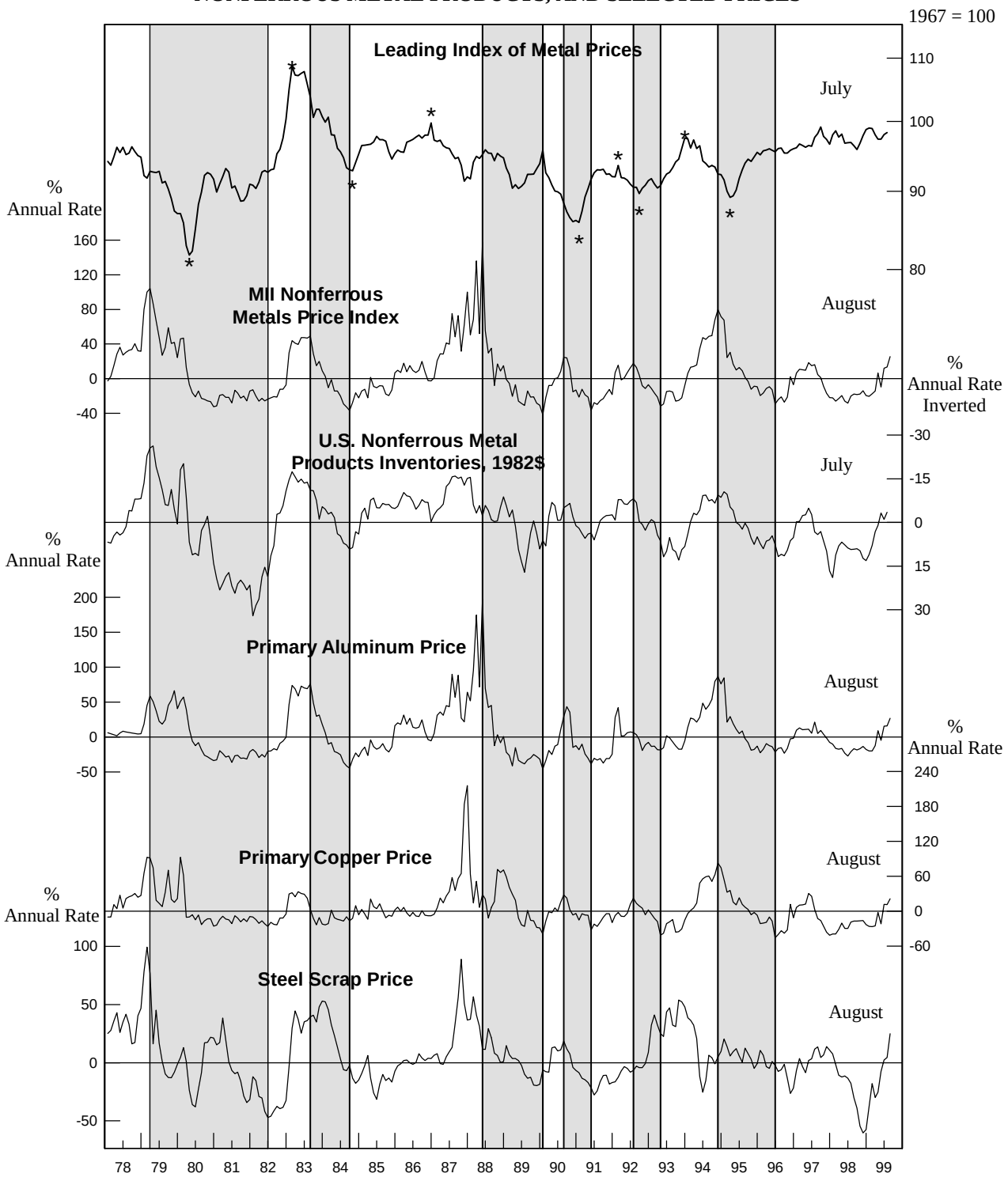
| | | Six-Month Smoothed Growth Rates | | | | |
|---|---|---|---|---|---|---|
| | Leading Index of Metal Prices (1967=100) | MII Nonferrous Metals Price Index | U.S. Nonferrous Metal Products Inventories (1982$) | Primary Aluminum | Primary Copper | Steel Scrap |
| **1998** | | | | | | |
| July | 96.9 | -20.2 | 9.3 | -21.3 | -18.5 | -17.7 |
| August | 96.4 | -17.9 | 9.2 | -17.1 | -16.8 | -30.0 |
| September | 95.9 | -18.4 | 9.0 | -18.6 | -16.9 | -39.0 |
| October | 96.8 | -17.7 | 9.7 | -16.8 | -16.5 | -54.5 |
| November | 97.9 | -13.9 | 12.3 | -13.5 | -15.9 | -60.2 |
| December | 98.8 | -19.4 | 13.1 | -18.0 | -23.0 | -57.4 |
| **1999** | | | | | | |
| January | 99.0r | -20.3 | 11.0 | -20.2 | -26.0 | -37.5 |
| February | 98.9r | -17.5 | 7.9 | -20.2 | -26.4 | -17.8 |
| March | 98.0r | -14.4 | 3.2r | -12.6 | -25.1 | -29.8 |
| April | 97.4r | 6.5 | 1.0r | 8.8 | -1.7 | -25.3 |
| May | 97.4 | -9.6 | -3.2 | -4.9 | -21.7 | -7.6 |
| June | 98.0r | 12.2 | -1.1r | 15.3 | 11.7 | 2.2 |
| July | 98.3 | 13.5 | -3.5 | 15.8 | 11.4 | 4.4 |
| August | NA | 25.6 | NA | 26.7 | 21.7 | 24.9 |

***NA:*** *Not available* ***r:*** *Revised*

**Note:** The components of the Leading Index of Metal Prices are the 6-month smoothed growth rates of the following: 1, the deflated value of new orders for nonferrous metals; 2, the OECD leading index, total; 3, the index of new private housing units authorized; and 4, the deflated value of U.S. M2 money supply. The Metal Industry Indicators (MII) Nonferrous Metals Price Index measures changes in end-of-the-month prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange (LME). The steel scrap price used is the price of No. 1 heavy melting. Inventories consist of the deflated value of finished goods, work in progress, and raw materials for U.S.-produced nonferrous metals and nonferrous metal products. Six-month smoothed growth rates are based on the ratio of the current month's index or price to its average over the preceding 12 months, expressed at a compound annual rate.

**Sources:** U.S. Geological Survey (USGS); American Metal Market (AMM); the London Metal Exchange (LME); the Bureau of the Census; and the Organization for Economic Cooperation and Development (OECD).

**CHART 1.**
**LEADING INDEX OF METAL PRICES AND GROWTH RATES OF NONFERROUS METALS PRICE INDEX, INVENTORIES OF NONFERROUS METAL PRODUCTS, AND SELECTED PRICES**




Shaded areas are downturns in the nonferrous metals price index growth rate. Asterisks (*) are peaks and troughs in the economic activity reflected by the leading index of metal prices. Scale for nonferrous metal products inventories is inverted.

U.S. Geological Survey, September 1999

## Table 2.
## The Primary Metals Industry Indexes and Growth Rates

| | Leading Index | | Coincident Index | |
|---|---|---|---|---|
| | (1977 = 100) | Growth Rate | (1977 = 100) | Growth Rate |
| **1998** | | | | |
| September | 124.3 | -6.0 | 110.7 | -1.7 |
| October | 124.7 | -4.8 | 110.2 | -2.6 |
| November | 126.1 | -2.2 | 109.6 | -3.4 |
| December | 125.1 | -3.2 | 109.6 | -3.0 |
| **1999** | | | | |
| January | 126.1 | -1.5 | 110.1 | -1.8 |
| February | 126.5 | -0.5r | 109.8 | -1.9 |
| March | 126.9 | 0.4 | 111.1 | 0.6r |
| April | 127.6 | 1.8 | 110.8 | 0.4r |
| May | 128.9 | 3.8r | 111.3 | 1.3 |
| June | 129.3r | 4.5r | 111.7r | 1.9r |
| July | 128.9 | 3.6 | 112.5 | 3.2 |
| August | 129.5 | 4.1 | NA | NA |

*NA: Not available* ***r:*** *Revised*

**Note**: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

## Table 3.
## The Contribution of Each Primary Metals Index Component to the Percent Change in the Index from the Previous Month

| **Leading Index** | **July** | **August** |
|---|---|---|
| 1. Average weekly hours, primary metals (SIC 33) | 0.2r | -0.2 |
| 2. S&P stock price index, machinery, diversified | -0.1 | 0.1 |
| 3. Ratio of price to unit labor cost (SIC 33) | -0.2 | NA |
| 4. JOC metals price index growth rate | 0.3 | 0.3 |
| 5. New orders, primary metals, (SIC 33) 1982$ | 0.1 | NA |
| 6. Index of new private housing units authorized by permit | 0.0 | NA |
| 7. Growth rate of U.S. M2 money supply, 1992$ | -0.3 | NA |
| 8. Purchasing Managers' Index | -0.4r | 0.2 |
| Trend adjustment | 0.0 | 0.0 |
| Percent change (except for rounding differences) | -0.4r | 0.4 |

| **Coincident Index** | **June** | **July** |
|---|---|---|
| 1. Industrial production index, primary metals (SIC 33) | 0.2r | 0.1 |
| 2. Total employee hours, primary metals (SIC 33) | -0.2r | 0.5 |
| 3. Value of shipments, primary metals, (SIC 33) 1982$ | 0.2 | 0.0 |
| Trend adjustment | 0.1 | 0.1 |
| Percent change (except for rounding differences) | 0.3r | 0.7 |

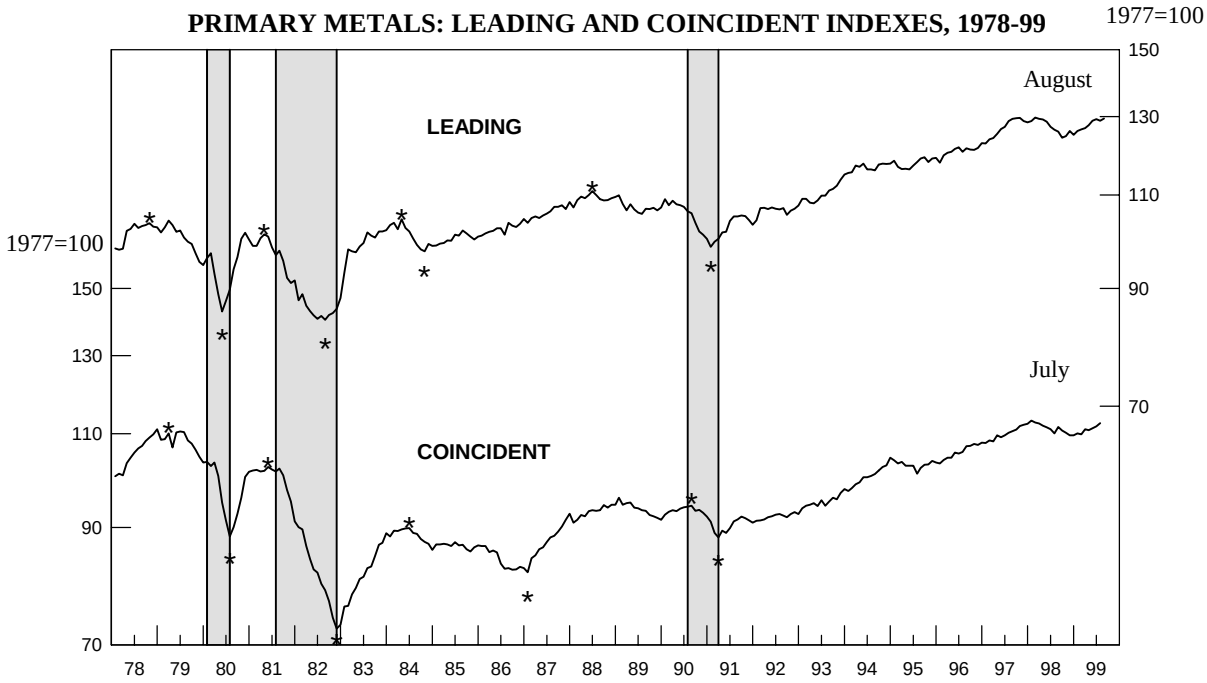
**Sources**: Leading: 1, Bureau of Labor Statistics; 2, Standard & Poor's; 3, Center for International Business Cycle Research, Bureau of Labor Statistics, and Federal Reserve Board; 4, Journal of Commerce; 5, Bureau of the Census and U.S. Geological Survey; 6, Bureau of the Census and U.S. Geological Survey; 7, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 8, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey. All series are seasonally adjusted, except 2, 3, and 4 of the leading index.

***NA:*** *Not available* ***r:*** *Revised*

**Note**: A component's contribution, shown in Tables 3, 5, 7, and 9, measures its effect, in percentage points, on the percent change in the index. Each month, the sum of the contributions plus the trend adjustment equals (except for rounding differences) the index's percent change from the previous month.

**CHART 2.**

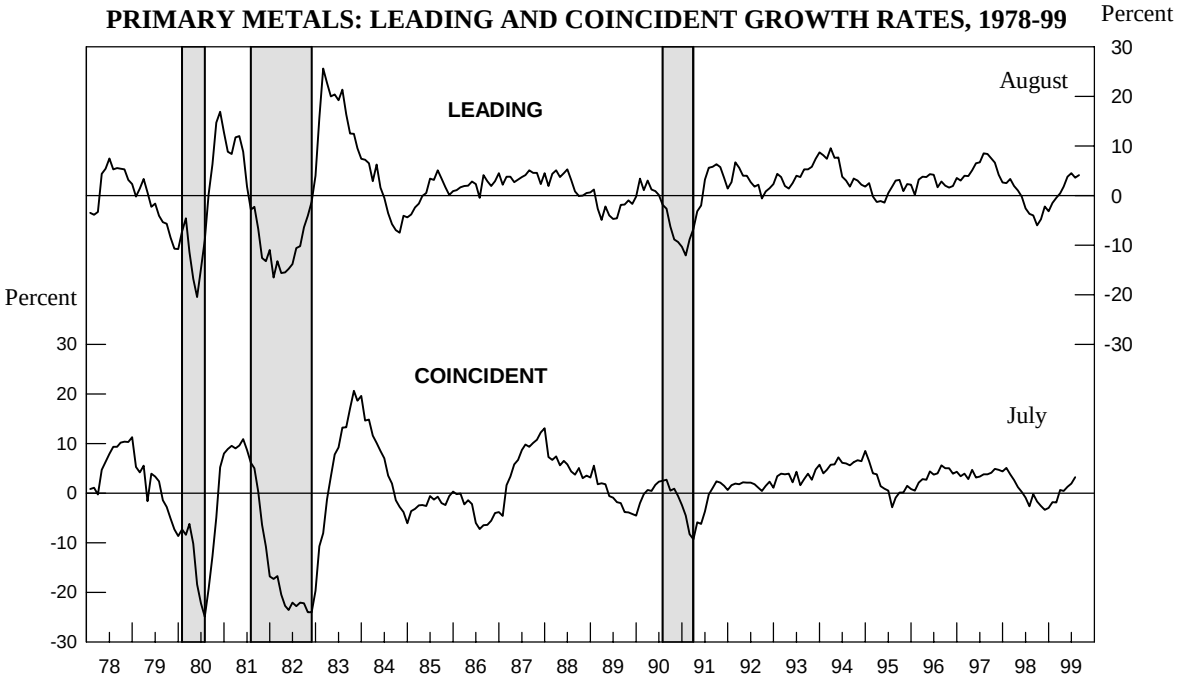
**PRIMARY METALS: LEADING AND COINCIDENT INDEXES, 1978-99**




Shaded areas are business cycle recessions. Asterisks (*) signify peaks (the end of an expansion) and troughs (the end of a downturn) in the economic activity reflected by the indexes.

**CHART 3.**

**PRIMARY METALS: LEADING AND COINCIDENT GROWTH RATES, 1978-99**




Shaded areas are business cycle recessions.

The growth rates are expressed as compound annual rates based on the ratio of the current month's index to its average level during the preceding 12 months.

U.S. Geological Survey, September 1999

## Table 4.
## The Steel Industry Indexes and Growth Rates

| | Leading Index | | Coincident Index | |
|---|---|---|---|---|
| | (1977 = 100) | Growth Rate | (1977 = 100) | Growth Rate |
| **1998** | | | | |
| August | 108.5 | -3.8 | 99.5 | -1.2 |
| September | 107.6 | -5.1 | 98.0 | -4.1 |
| October | 107.7 | -4.4 | 97.5 | -4.6 |
| November | 108.9 | -2.0 | 96.5 | -6.0 |
| December | 108.3 | -2.7 | 96.7 | -5.2 |
| **1999** | | | | |
| January | 110.0 | 0.6 | 97.2 | -3.7 |
| February | 111.8 | 3.9 | 97.3 | -2.8 |
| March | 110.5 | 1.6r | 98.4 | -0.2 |
| April | 111.5 | 3.6 | 98.7 | 0.8 |
| May | 112.5 | 5.3 | 99.3 | 2.0 |
| June | 112.9 | 5.8 | 99.5r | 2.7r |
| July | 112.3 | 4.2 | 99.9 | 3.4 |

***r:*** *Revised*

**Note**: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

## Table 5.
## The Contribution of Each Steel Index Component to the Percent Change in the Index from the Previous Month

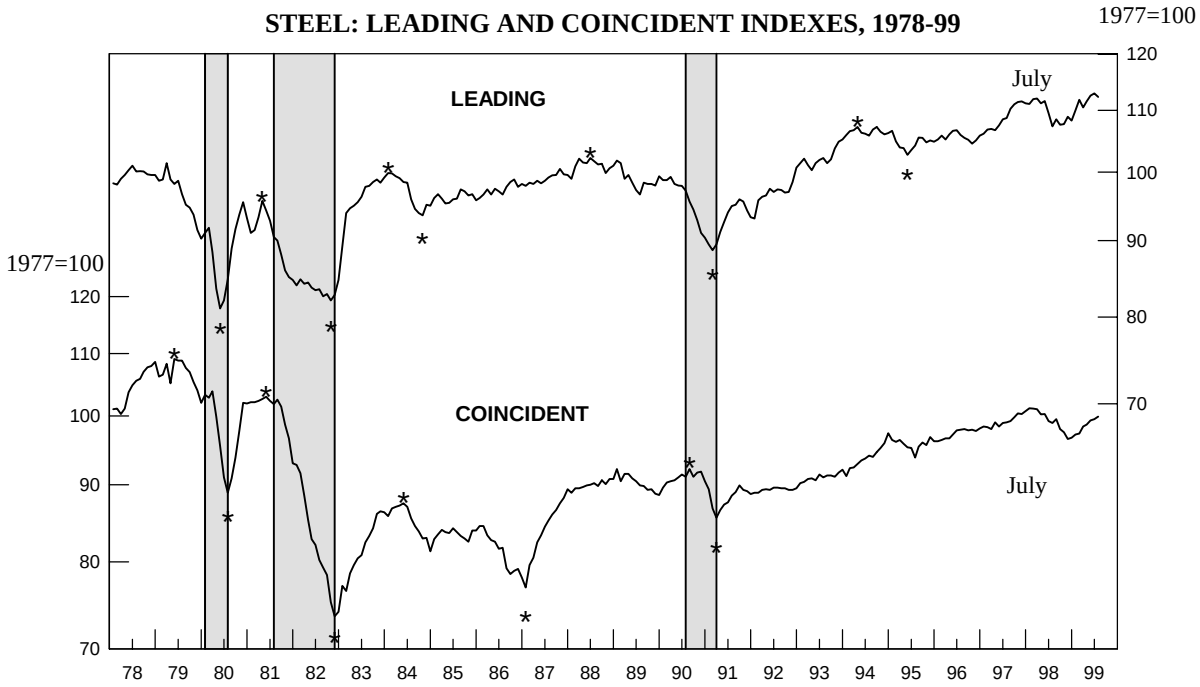
| **Leading Index** | **June** | **July** |
|---|---|---|
| 1. Average weekly hours, blast furnaces and basic steel products (SIC 331) | 0.3r | -0.1 |
| 2. New orders, steel works, blast furnaces, and rolling and finishing mills, 1982$, (SIC 331) | 0.0 | -0.1 |
| 3. Shipments of household appliances, 1982$ | 0.0 | 0.2 |
| 4. S&P stock price index, steel companies | -0.5 | 0.3 |
| 5. Industrial production index for automotive products | 0.1 | -0.4 |
| 6. Growth rate of the price of steel scrap (#1 heavy melting, $/ton) | 0.2 | 0.1 |
| 7. Index of new private housing units authorized by permit | 0.2 | 0.0 |
| 8. Growth rate of U.S. M2 money supply, 1992$ | -0.1 | -0.2 |
| 9. Purchasing Managers' Index | 0.2 | -0.4 |
| Trend adjustment | 0.0 | 0.0 |
| Percent change (except for rounding differences) | 0.4r | -0.6 |
| **Coincident Index** | | |
| 1. Industrial production index, basic steel and mill products (SIC 331) | 0.2r | 0.1 |
| 2. Value of shipments, steel works, blast furnaces, and rolling and finishing mills (SIC 331), 1982$ | -0.2r | 0.1 |
| 3. Total employee hours, blast furnaces and basic steel products (SIC 331) | 0.1r | 0.1 |
| Trend adjustment | 0.1 | 0.1 |
| Percent change (except for rounding differences) | 0.2r | 0.4 |

**Sources**: Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey; 4, Standard & Poor's; 5, Federal Reserve Board; 6, Journal of Commerce and U.S. Geological Survey; 7, Bureau of the Census and U.S. Geological Survey; 8, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 9, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of the Census and U.S. Geological Survey; 3, Bureau of Labor Statistics and U.S. Geological Survey. All series are seasonally adjusted, except 4 and 6 of the leading index.

***r****: Revised*

**CHART 4.**

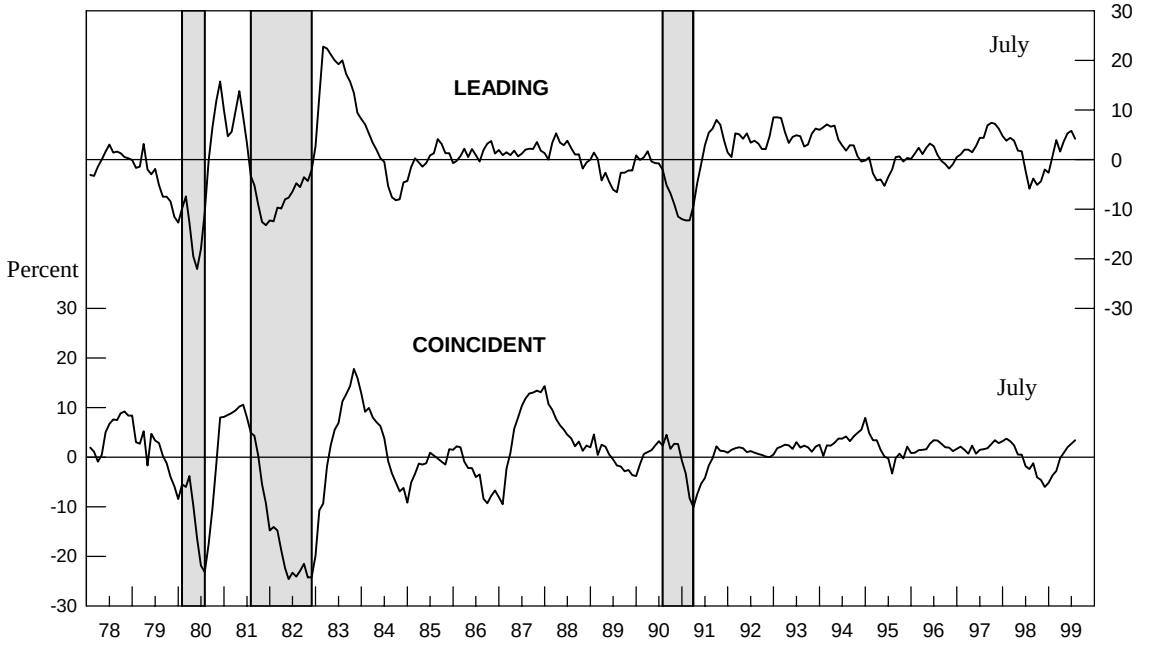
**STEEL: LEADING AND COINCIDENT INDEXES, 1978-99**




Shaded areas are business cycle recessions. Asterisks (*) signify peaks (the end of an expansion) and troughs (the end of a downturn) in the economic activity reflected by the indexes.

**CHART 5.**

**STEEL: LEADING AND COINCIDENT GROWTH RATES, 1978-99**




Shaded areas are business cycle recessions.

The growth rates are expressed as compound annual rates based on the ratio of the current month's index to its average level during the preceding 12 months.

U.S. Geological Survey, September 1999

## Table 6.
## The Aluminum Mill Products Industry Indexes and Growth Rates

| | Leading Index | | Coincident Index | |
|---|---|---|---|---|
| | (1977 = 100) | Growth Rate | (1977 = 100) | Growth Rate |
| **1998** | | | | |
| August | 155.0 | 3.5 | 141.0 | 0.0 |
| September | 155.2 | 3.1 | 141.1 | 0.1 |
| October | 154.3 | 1.6 | 137.9 | -4.0 |
| November | 152.5 | -0.7 | 136.7 | -5.1 |
| December | 154.7 | 1.8 | 135.5 | -6.1 |
| **1999** | | | | |
| January | 155.3 | 2.2 | 136.9 | -3.8 |
| February | 154.7 | 1.4 | 136.8 | -3.3 |
| March | 156.1r | 3.1 | 139.7 | 1.1 |
| April | 156.0 | 2.7 | 139.6r | 0.9r |
| May | 157.5r | 4.2 | 140.5 | 2.1 |
| June | 159.0r | 5.4r | 140.6r | 2.2r |
| July | 158.1 | 3.6 | 140.4 | 2.0 |

***r:*** *Revised*

**Note**: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

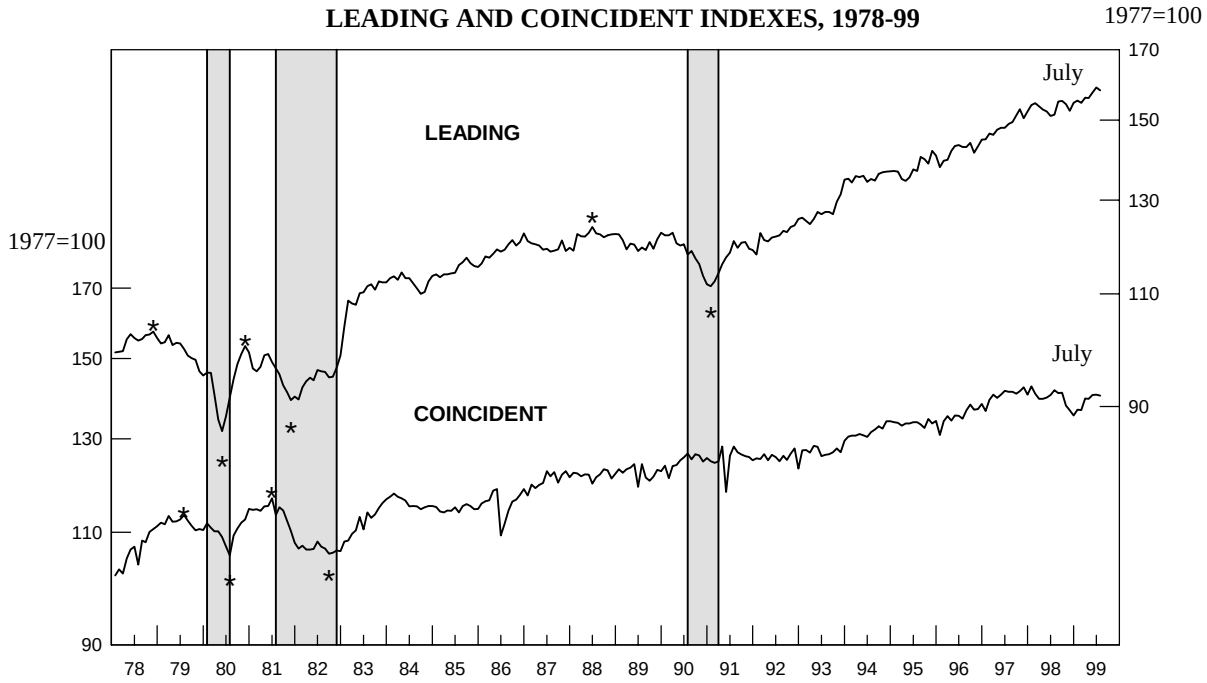
## Table 7.
## The Contribution of Each Aluminum Mill Products Index Component to the Percent Change in the Index from the Previous Month

| **Leading Index** | **June** | **July** |
|---|---|---|
| 1. Average weekly hours, aluminum sheet, plate, and foil (SIC 3353) | 0.2r | 0.6 |
| 2. Index of new private housing units authorized by permit | 0.2 | 0.0 |
| 3. Industrial production index for automotive products | 0.2 | -0.4 |
| 4. Construction contracts, commercial and industrial (square feet) | 0.1 | 0.1 |
| 5. Net new orders for aluminum mill products (pounds) | 0.0 | 0.0 |
| 6. Growth rate of U.S. M2 money supply, 1992$ | -0.2r | -0.3 |
| 7. Purchasing Managers' Index | 0.3 | -0.5 |
| Trend adjustment | 0.1 | 0.1 |
| Percent change (except for rounding differences) | 0.9r | -0.5 |
| **Coincident Index** | | |
| 1. Industrial production index, aluminum sheet, plate, and foil (SIC 3353) | 0.2r | 0.1 |
| 2. Total employee hours, aluminum sheet, plate, and foil (SIC 3353) | -0.3r | -0.4 |
| Trend adjustment | 0.2 | 0.2 |
| Percent change (except for rounding differences) | 0.1r | -0.1 |

**Sources:** Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, Federal Reserve Board; 4, F.W. Dodge, Division of McGraw-Hill Information Systems Company; 5, The Aluminum Association, Inc. and U.S. Geological Survey; 6, Federal Reserve Board, Conference Board, and U.S. Geological Survey; 7, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey. All series are seasonally adjusted.

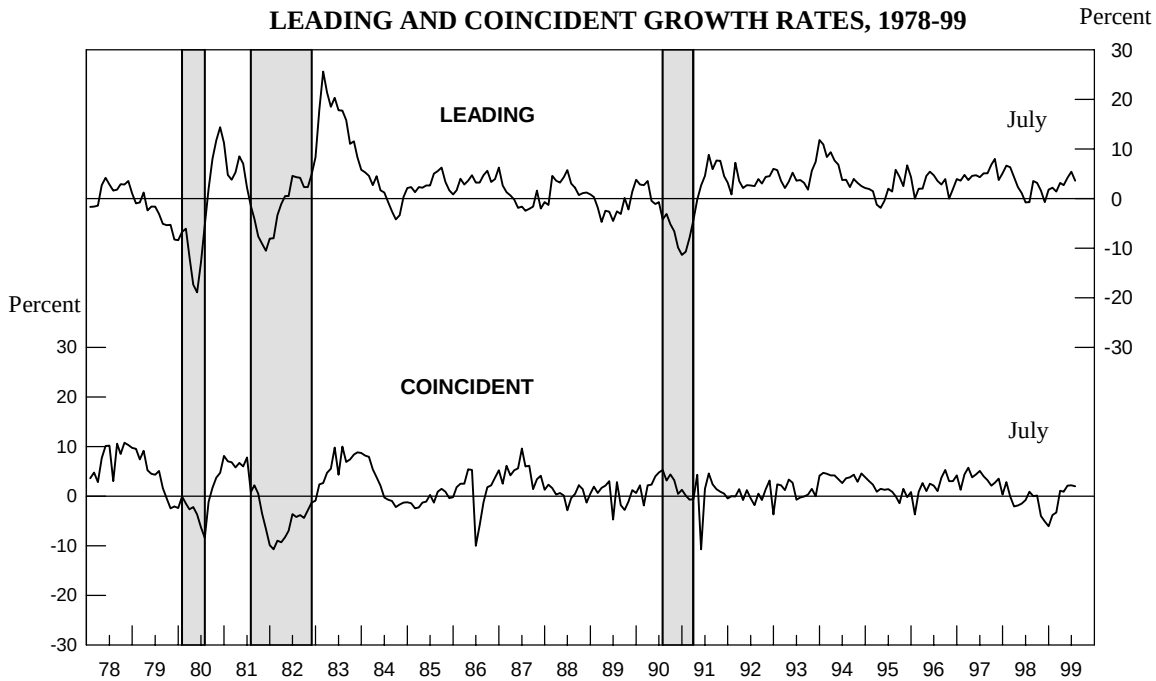
***r:*** *Revised*

**CHART 6.**
**ALUMINUM MILL PRODUCTS:**
**LEADING AND COINCIDENT INDEXES, 1978-99**




Shaded areas are business cycle recessions. Asterisks (*) signify peaks (the end of an expansion) and troughs (the end of a downturn) in the economic activity reflected by the indexes.

**CHART 7.**
**ALUMINUM MILL PRODUCTS:**
**LEADING AND COINCIDENT GROWTH RATES, 1978-99**




Shaded areas are business cycle recessions.

The growth rates are expressed as compound annual rates based on the ratio of the current month's index to its average level during the preceding 12 months.

U.S. Geological Survey, September 1999

## Table 8.
## The Copper Industry Indexes and Growth Rates

| | Leading Index | | Coincident Index | |
|---|---|---|---|---|
| | (1977 = 100) | Growth Rate | (1977 = 100) | Growth Rate |
| **1998** | | | | |
| August | 127.9 | 0.8 | 125.1 | 0.7 |
| September | 127.1 | -0.5 | 124.9 | 0.2 |
| October | 126.9 | -0.4 | 125.3 | 0.8 |
| November | 130.3 | 4.6 | 126.0 | 1.6 |
| December | 130.4 | 4.2 | 125.7 | 1.0 |
| **1999** | | | | |
| January | 130.8 | 4.3 | 123.7 | -2.0 |
| February | 129.2 | 1.5 | 123.5 | -1.9 |
| March | 128.5 | 0.2r | 124.1 | -1.0 |
| April | 130.5 | 2.9 | 124.1r | -0.8r |
| May | 130.4 | 2.3 | 122.4r | -3.2r |
| June | 132.2r | 4.6r | 121.7r | -4.1r |
| July | 132.8 | 4.9 | 122.1 | -3.1 |

***r:*** *Revised*

**Note**: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

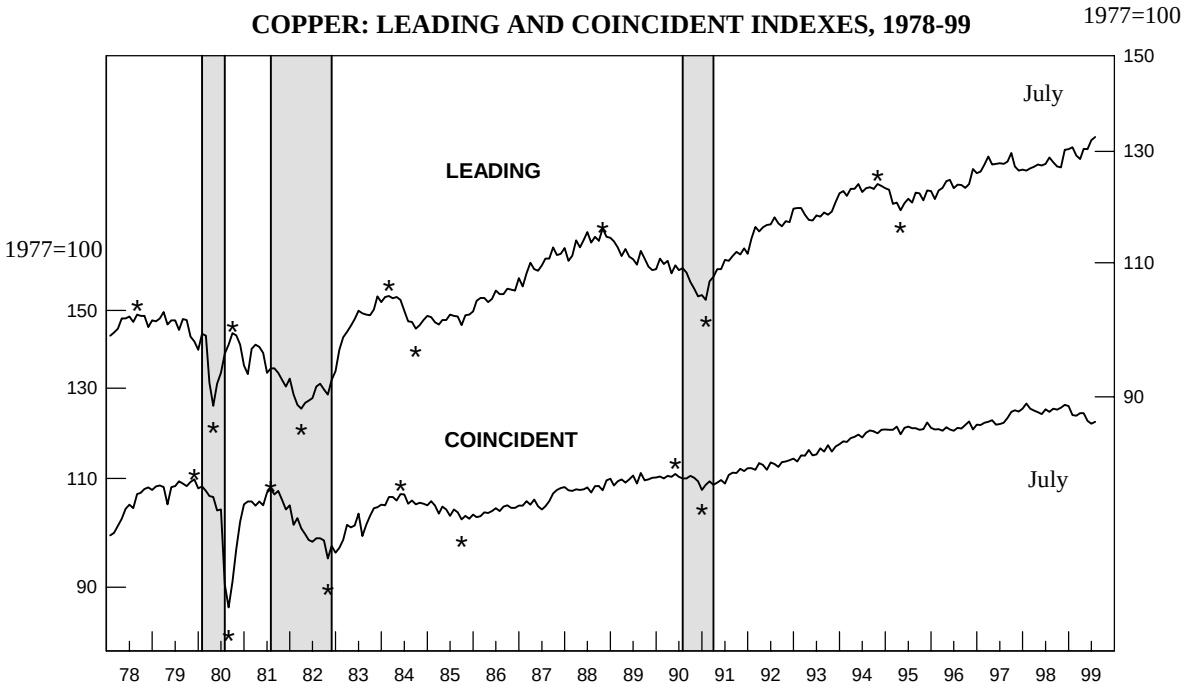
## Table 9.
## The Contribution of Each Copper Index Component to the Percent Change in the Index from the Previous Month

| **Leading Index** | **June** | **July** |
|---|---|---|
| 1. Average weekly overtime hours, rolling, drawing, and extruding of copper (SIC 3351) | -0.3 | 0.2 |
| 2. New orders, nonferrous and other primary metals, 1982$ | 0.3r | 0.1 |
| 3. S&P stock price index, building materials companies | -0.1 | 0.0 |
| 4. Ratio of shipments to inventories, electronic and other electrical equipment (SIC 36) | 0.1r | 0.4 |
| 5. LME spot price of primary copper | 0.9 | 0.0 |
| 6. Index of new private housing units authorized by permit | 0.2 | 0.0 |
| 7. Spread between the U.S. 10-year Treasury Note and the Federal Funds rate | 0.3 | -0.3 |
| Trend adjustment | 0.0 | 0.0 |
| Percent change (except for rounding differences) | 1.4r | 0.4 |
| **Coincident Index** | | |
| 1. Industrial production index, primary smelting and refining of copper (SIC 3331) | -0.2r | -0.2 |
| 2. Total employee hours, rolling, drawing, and extruding of copper (SIC 3351) | -0.6r | 0.3 |
| 3. Copper refiners' shipments (short tons) | 0.2r | 0.1 |
| Trend adjustment | 0.1 | 0.1 |
| Percent change (except for rounding differences) | -0.5r | 0.3 |

**Sources**: Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, Standard & Poor's; 4, Bureau of the Census and U.S. Geological Survey; 5, London Metal Exchange; 6, Bureau of the Census and U.S. Geological Survey; 7, Federal Reserve Board and U.S. Geological Survey. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics; 3, American Bureau of Metal Statistics, Inc. and U.S. Geological Survey. All series are seasonally adjusted, except 3, 5, and 7 of the leading index.

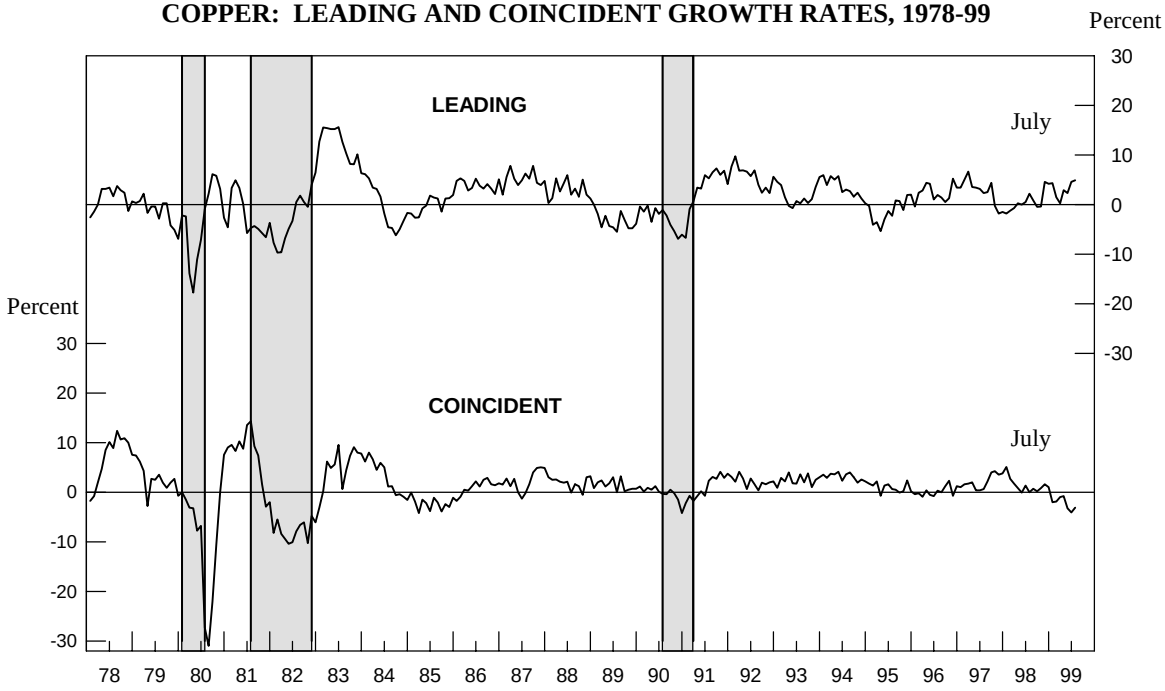
***r:*** *Revised*

**CHART 8.**
**COPPER: LEADING AND COINCIDENT INDEXES, 1978-99**




Shaded areas are business cycle recessions. Asterisks (*) signify peaks (the end of an expansion) and troughs (the end of a downturn) in the economic activity reflected by the indexes.

**CHART 9.**
**COPPER: LEADING AND COINCIDENT GROWTH RATES, 1978-99**




Shaded areas are business cycle recessions.

The growth rates are expressed as compound annual rates based on the ratio of the current month's index to its average level during the preceding 12 months.

U.S. Geological Survey, September 1999

## Explanation

Each month, the U.S. Geological Survey tracks the effects of the business cycle on five U.S. metal industries by calculating and publishing composite indexes of leading and coincident indicators. Wesley Mitchell and Arthur Burns originated the cyclical-indicators approach for the economy as a whole at the National Bureau of Economic Research in the mid-1930's. Over subsequent decades this approach was developed and refined, mostly at the National Bureau, under the leadership of Geoffrey H. Moore.[1]

A business cycle can briefly be described as growth in the level of economic activity followed by a decline succeeded by further growth. These alternating periods of growth and decline do not occur at regular intervals. Composite indexes, however, can help determine when highs and lows in the cycle might occur. A composite index combines cyclical indicators of diverse economic activity into one index, giving decision makers and economists a single measure of how changes in the business cycle are affecting economic activity.

The indicators in the metal industry leading indexes historically give signals several months in advance of major changes in a coincident index, a measure of current metal industry activity. Indicators that make up the leading indexes are, for the most part, measures of anticipations or new commitments to various economic activities that can affect the metal industries in the months ahead.

Composite coincident indexes for the metal industries consist of indicators for production, shipments, and total employee hours worked. As such, the coincident indexes can be regarded as measures of the economic health of the metal industries.

Four of the metal industry coincident indexes, those for primary metals, steel, primary aluminum, and aluminum mill products, reflect their classifications in the U.S. Standard Industrial Classification (SIC). The SIC is the main classification used by the United States government and industry in collecting and tabulating economic statistics. The coincident index for copper is a blend of two different copper industries, primary smelting and refining of copper and rolling, drawing, and extruding of copper.

Of the five metal industries, primary metals is the broadest, consisting of twenty-six different metal processing industries. The steel, aluminum, and copper industries are parts of the primary metals industry.

The metal industry leading indexes turn before their respective coincident indexes an average of 9 months for primary metals and 8 months for steel and copper. The average lead time for the primary aluminum leading index is 6 to 8 months, and the average lead time for the aluminum mill products leading index is 6 months.

The leading index of metal prices, also published in the *Metal Industry Indicators*, is designed to signal changes in a composite index of prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange. On average, this leading index indicates significant changes in price growth about 7 months in advance.

The growth rate used in the *Metal Industry Indicators* is a 6-month smoothed growth rate at a compound annual rate, calculated from a moving average. Moving averages smooth fluctuations in data over time so that trends can be observed. The 6-month smoothed growth rate is based upon the ratio of the latest monthly value to the preceding 12-month moving average.

$$\left[\left(\frac{\text{current value}}{\text{preceding 12-month moving average}}\right)^{\frac{12}{6.5}} - 1.0\right] * 100$$

Because the interval between midpoints of the current month and the preceding 12 months is 6.5 months, the ratio is raised to the 12/6.5 power to derive a compound annual rate.

The growth rates measure the near-term industry trends. They, along with other information about the metal industries and the world economy, are the main tools used to determine the outlook of the industries. A 6-month smoothed growth rate above +1.0% usually means increasing growth; a rate below -1.0% usually means declining growth.

**The next summary is scheduled for release on MINES FaxBack at 10:00 a.m. EDT, Friday, October 22. Access MINES FaxBack from a touch-tone telephone attached to a fax machine by dialing 703-648-4999. The address for *Metal Industry Indicators* on the World Wide Web is: http://minerals.usgs.gov/minerals/pubs/mii/**

The ***Metal Industry Indicators*** is produced at the U.S. Geological Survey by the Minerals Information Team. The report is prepared by Kenneth Beckman (703-648-4916), e-mail (kbeckman@usgs.gov), and Gail James (703-648-4915), e-mail (gjames@usgs.gov). The Center for International Business Cycle Research, under the direction of Dr. Geoffrey H. Moore, and the former U.S. Bureau of Mines developed the metal industry leading and coincident indexes in the early 1990's. Customers can send mail concerning the *Metal Industry Indicators* to the following address:

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[1]**Business Cycle Indicators, A monthly report from The Conference Board** (March 1996).